

MATERIAL SAFETY DATA SHEET



Emergency Phone: 800-992-5994
Dow AgroSciences LLC • Indianapolis, IN
46268

Effective Date: 06/23/98
Product Code: 20143
MSDS: 003737

RUBIGAN* E.C. FUNGICIDE

1. PRODUCT AND COMPANY IDENTIFICATION:

PRODUCT: RUBIGAN* E.C. FUNGICIDE

COMPANY IDENTIFICATION:

Dow AgroSciences LLC
P.O. Box 681428
9330 Zionsville Road
Indianapolis, IN 46268-1189
www.dowagro.com

2. COMPOSITION/INFORMATION ON INGREDIENTS:

Fenarimol:

alpha-(2-Chlorophenyl)-alpha- (4-chlorophenyl)-5-
pyrimidine-methanol CAS # 060168-88-9 12%

Ingredients, Total, Including: 88%

Toximul H-A Surfactant (Methanol) CAS # 000067-56-1

Aromatic 200 (Naphthalene) CAS # 000091-20-3

This document is prepared pursuant to the OSHA Hazard Communication Standard (29 CFR) 1910.1200). In addition, other substances not 'Hazardous' per this OSHA Standard may be listed. Where proprietary ingredient shows, the identity may be made available as provided in this standard.

3. HAZARDOUS IDENTIFICATIONS:

EMERGENCY OVERVIEW

Hazardous chemical. Amber/pale brown liquid with an aromatic odor. May cause severe eye irritation with corneal injury, resulting in permanent vision impairment or blindness. May cause skin irritation. LD₅₀ for skin absorption in rabbits is >2000 mg/kg. Oral LD₅₀ for male rats is 1270 mg/kg and female rats is 1057 mg/kg. LC₅₀ for male rats is between 2.27 and 4.51 mg/L for 4 hours. Combustible liquid. Avoid freezing. Do not store near heat or flame. Toxic to fish.

EMERGENCY PHONE NUMBER: (U.S.) 800-992-5994

POTENTIAL HEALTH EFFECTS: This section includes possible adverse effects which could occur if this material is not handled in the recommended manner.

EYE: May cause severe irritation with corneal injury which may result in permanent impairment of vision, even blindness.

SKIN: Short single exposure may cause skin irritation. Prolonged or repeated exposure may cause severe skin irritation. A single prolonged exposure is not likely to result in the material being absorbed through skin in harmful amounts. The LD₅₀ for skin absorption in rabbits is >2000 mg/kg. Did not cause allergic skin reactions when tested in guinea pigs.

INGESTION: Single dose oral toxicity is low. The oral LD₅₀ for rats are 1270 mg/kg (males) and 1057 mg/kg (females). Small amounts swallowed incidental to normal handling operations are not likely to cause injury; however, swallowing larger amounts may cause injury. If aspirated (liquid enters the lung), may cause lung damage or even death due to chemical pneumonia.

INHALATION: Excessive exposure may cause irritation to upper respiratory tract (nose and throat) and lungs. The LC₅₀ for male rats is between 2.27 and 4.51 mg/L for 4 hours. Signs and symptoms of excessive exposure may be central nervous system effects. Naphthalene is reported to cause heavy perspiration, nausea, and vomiting.

SYSTEMIC (OTHER TARGET ORGAN) EFFECTS: In animals, has been shown to cause liver and kidney effects. Signs and symptoms of excessive exposure may be anesthetic or narcotic effects. Cataracts and other eye effects have been reported in humans repeatedly exposed to naphthalene vapor or dust.

CANCER INFORMATION: Fenarimol did not cause cancer in laboratory animals. Naphthalene did not cause cancer in some laboratory animals. An increase in lung tumors was observed in female, but not male, mice exposed to naphthalene by inhalation for two years. In humans, there is limited evidence of cancer in workers involved in naphthalene production. Limited oral studies in rats were negative.

TERATOLOGY (BIRTH DEFECTS): Fenarimol did not cause birth defects, but did produce other fetal effects at doses non-toxic to the mother. For the other tested components: did not cause birth defects in laboratory animals.

REPRODUCTIVE EFFECTS: Fenarimol has been shown to interfere with reproduction and fertility in animal studies.

4. FIRST AID:

EYES: Immediate and continuous irrigation with flowing water for at least 30 minutes is imperative. Prompt medical consultation is essential.

SKIN: Wash off in flowing water or shower.

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INGESTION: Do not induce vomiting. Call a physician and/or transport to an emergency facility immediately.

INHALATION: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, oxygen should be administered by qualified personnel. Call a physician or transport to a medical facility.

NOTE TO PHYSICIAN: The decision of whether to induce vomiting or not should be made by an attending physician. If lavage is performed, suggest endotracheal and/or esophageal control. Danger from lung aspiration must be weighed against toxicity when considering emptying the stomach. No specific antidote. Supportive care. Treatment based on judgment of the physician in response to reactions of the patient.

5. FIRE FIGHTING MEASURES:

FLASH POINT: 104°F, 40°C **METHOD USED:** SCC
FLAMMABLE LIMITS:

LFL: 1.1 +/- 0.1 % by vol at 80°C **UFL:** Not available

AUTO-IGNITION TEMPERATURE: 738°F, 392°C

EXTINGUISHING MEDIA: Use water, CO₂, or dry chemicals.

FIRE AND EXPLOSION HAZARDS: Classified as a combustible liquid. Closed containers may explode due to pressure build-up when subjected to excessive heat or intense fire. Will emit toxic fumes and gases when it burns.

FIRE-FIGHTING EQUIPMENT: Wear full protective clothing and positive-pressure, self-contained breathing apparatus.

6. ACCIDENTAL RELEASE MEASURES: (See Section 15 for Regulatory Information)

ACTION TO TAKE FOR SPILLS: Use absorbent materials to contain and clean up small spills and dispose as waste. Report large spills to CHEMTREC and contact Dow AgroSciences for assistance. Prohibit the use of hot or sparking equipment in immediate area. Prevent runoff.

7. HANDLING AND STORAGE:

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: Keep out of reach of children. Causes substantial eye injury and skin irritation. Harmful if swallowed, inhaled, or absorbed through the skin. Do not get in eyes, on skin, or on clothing. Avoid breathing vapor or spray mists. Avoid freezing. Do not use or store near heat or open flame. Store in original container only.

Users should wash their hands before eating, drinking, chewing gum, using tobacco, or using the toilet. For handling relative to the end-use of this product or information concerning the use of personal protective equipment (PPE) under the Worker Protection Standard of 1993, read the product label.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION:

These precautions are suggested for conditions with a high potential for exposure. If handling procedures are such that there is only a low potential for exposure, less protection may be needed. Emergency conditions may require additional precautions.

EXPOSURE GUIDELINE(S):

Aromatic 200 (petroleum solvent): none established.

Supplier recommends a guideline of 100 ppm for the total product, which is a mixture of aromatic hydrocarbons.

Naphthalene: ACGIH TLV and OSHA PEL are 10 ppm TWA, 15 ppm STEL.

Propylene Glycol Methyl Ether: ACGIH TLV and OSHA PEL are 100 ppm TWA, 150 ppm STEL. PELs are in accord with those recommended by OSHA, as in the 1989 revision of PELs.

ENGINEERING CONTROLS: Provide general and/or local exhaust ventilation to control airborne levels below the exposure guidelines.

RESPIRATORY PROTECTION: Atmospheric levels should be maintained below the exposure guidelines. When respiratory protection is required for certain operations, use a NIOSH approved air-purifying respirator.

SKIN PROTECTION: Use protective clothing impervious to this material. Selection of specific items such as faceshield, gloves, boots, apron, or full body suit will depend on the operation.

EYE PROTECTION: Use chemical goggles. Eye wash fountain should be located in immediate work area.

9. PHYSICAL AND CHEMICAL PROPERTIES:

BOILING POINT: (@ 1 atmosphere) 239°F, 115°

VAPOR PRESSURE: 7.1 mm Hg at 25°C

VAPOR DENSITY: 1.020 relative to air at 25°C

SOLUBILITY IN WATER: Emulsifies in water

SPECIFIC GRAVITY: 0.998 g/ml at 20°C

APPEARANCE: Amber/pale brown liquid

ODOR: Aromatic odor

pH: (aqueous 50/50) 4.8 to 5.3

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10. STABILITY AND REACTIVITY:

STABILITY: (CONDITIONS TO AVOID) Do not store near heat or flame.

INCOMPATIBILITY: (SPECIFIC MATERIALS TO AVOID) Avoid freezing.

HAZARDOUS DECOMPOSITION PRODUCTS: Nitrogen oxides and other toxic vapors will be formed if product is involved in fire.

HAZARDOUS POLYMERIZATION: Not known to occur.

11. TOXICOLOGICAL INFORMATION:

(See Section 3 for Potential Health Effects)

For detailed toxicological data, write the address shown in Section 1.

MUTAGENICITY: In-vitro and animal mutagenicity studies were negative.

12. ECOLOGICAL INFORMATION:

For detailed ecological data, write the address shown in Section 1.

ENVIRONMENTAL DATA: This product is toxic to fish. Do not apply directly to water, to areas where surface water is present, or to intertidal areas below the mean high water mark. Drift and runoff from treated areas may be hazardous to aquatic organisms in neighboring areas. Do not apply when weather conditions favor runoff or drift from the target area. Do not contaminate water when disposing of equipment washwaters or rinsate.

13. DISPOSAL CONSIDERATIONS:

DISPOSAL METHOD: Do not contaminate food, feed, or water by storage or disposal. Pesticide wastes are toxic. Improper disposal or excess pesticide, spray mixture, or rinsate is a violation of federal law. If wastes resulting from the use of this product cannot be disposed of according to label instructions, dispose of these wastes at an approved facility. Contact your state pesticide or environmental control agency, or the hazardous waste representative at the nearest EPA regional office for guidance.

14. TRANSPORT INFORMATION:

For DOT regulatory information, if required, consult transportation regulations, product shipping papers, or contact your Dow AgroSciences representative.

15. REGULATORY INFORMATION:

NOTICE: The information herein is presented in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ from one location to another; it is the buyer's responsibility to ensure that its activities comply with federal, state or provincial, and local laws. The following specific information is made for the purpose of complying with numerous federal, state or provincial, and local laws and regulations.

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U.S. REGULATIONS

SARA 313 INFORMATION: This product contains the following substances subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372:

| CHEMICAL NAME | CAS NUMBER | CONCENTRATION |
|------------------------------------------|-------------|---------------|
| METHANOL | 000067-56-1 | 5 % |
| NAPHTHALENE | 000091-20-3 | 65.86 % |
| FENARIMOL O-ALPHA-(2-CHLOROPHENYL)-.ALPH | 060168-88-9 | 12 % |

SARA HAZARD CATEGORY: This product has been reviewed according to the EPA "Hazard Categories" promulgated under Sections 311 and 312 of the Superfund Amendment and Reauthorization Act of 1986 (SARA Title III) and is considered, under applicable definitions, to meet the following categories:

- An immediate health hazard
- A delayed health hazard
- A fire hazard

TOXIC SUBSTANCES CONTROL ACT (TSCA):

All ingredients are on the TSCA inventory or are not required to be listed on the TSCA inventory.

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STATE RIGHT-TO-KNOW: The following product components are cited on certain state lists as mentioned. Non-listed components may be shown in the composition section of the MSDS.

| CHEMICAL NAME | CAS NUMBER | LIST |
|-----------------------------------------------|-------------|---------------------|
| METHANOL | 000067-56-1 | NJ3 PA1 NJ1 NJ2 PA3 |
| NAPHTHALENE | 000091-20-3 | NJ3 PA1 NJ2 PA3 |
| PRORIETARY INGREDIENT | | NJ3 PA1 |
| FENARIMOL Õ.ALPHA-(2-CHLOROPHENYL)-.ALPHA.-4- | 060168-88-9 | NJ2 |

NJ1=New Jersey Special Health Hazard Substance
(present at greater than or equal to 0.1%).

NJ2=New Jersey Environmental Hazardous Substance
(present at greater than or equal to 1.0%).

NJ3=New Jersey Workplace Hazardous Substance
(present at greater than or equal to 1.0%).

PA1=Pennsylvania Hazardous Substance (present at
greater than or equal to 1.0%).

PA3=Pennsylvania Environmental Hazardous Substance
(present at greater than or equal to 1.0%).

OSHA HAZARD COMMUNICATION STANDARD:

This product is a "Hazardous Chemical" as defined by the
OSHA Hazard Communication Standard, 29 CFR
1910.1200.

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

RATINGS:

Health 2

Flammability 2

Reactivity 0

COMPREHENSIVE ENVIRONMENTAL RESPONSE COMPENSATION AND LIABILITY ACT (CERCLA, or SUPERFUND):

This product contains the following substance(s) listed as
"Hazardous Substances" under CERCLA which may require
reporting of releases:

| Chemical Name | CAS# | RQ | % in Product |
|---------------------------|-------------|------|--------------|
| Methanol (Toximul H-A) | 000067-56-1 | 5000 | 5.00% |
| Napthalene (Aromatic 200) | 000091-20-3 | 100 | 65.86% |

RCRA Categorization

USEPA Hazardous Waste# Methanol (Toximul H-A)=U154

Napthalene (Aromatic 200) = U165

16. OTHER INFORMATION:

Revised sections 2,3,4,6,7,8,9,10,14, and 15

Reference: DR-0269-6471

Replaces MSDS Dated: February 12, 1997

The Information Herein Is Given In Good Faith, But No
Warranty, Express Or Implied, Is Made. Consult Dow
AgroSciences For Further Information.